WHAT IS CLAIMED IS:

1. A decoder for decoding convolutionally encoded data from a communication channel, the channel being associated with a predetermined plurality of dominant error events, the decoder comprising:

a Viterbi detector, the Viterbi detector being configured to detect a survivor path for an input symbol and to make a hard decision about a polarity of the input symbol based on the survivor path;

circuitry configured to determine which of the plurality of dominant error events are possible dominant error events with respect to the input symbol;

circuitry configured to determine which of the possible dominant error events has a least penalty metric with respect to the survivor path; and

a calculator configured to compute an approximation to a logarithmic likelihood ratio for the input symbol based on the survivor path and the determined possible dominant error event having the least penalty metric.

2. The decoder of claim 1, the communication channel comprising a controlled intersymbol interference channel.

3. The decoder of claim 2, the controlled intersymbol interference channel being capable of being modeled as a finite impulse response (FIR) filter.

4. The decoder of claim 3, the controlled intersymbol interference channel comprising a partial response channel.

5. The decoder of claim 4, the partial response channel comprising a partial response class-IV (PR4) channel.

6. The decoder of claim 4, the partial response channel comprising an extended partial response class-IV (EPR4) channel.

7. A read channel for a hard disk drive, the read channel being associated with a predetermined plurality of dominant error events, and the read channel including a decoder for decoding data accessed by the read channel, the decoder comprising:

a Viterbi detector, the Viterbi detector being configured to detect a survivor path for an input symbol and to make a hard decision about a polarity of the input symbol based on the survivor path;

circuitry configured to determine which of the plurality of dominant error events are possible dominant error events with respect to the input symbol;

circuitry configured to determine which of the possible dominant error events has a least penalty metric with respect to the survivor path; and

a calculator configured to compute an approximation to a logarithmic likelihood ratio for the input symbol based on the survivor path and the determined possible dominant error event having the least penalty metric.

8. The read channel of claim 7, the read channel comprising a controlled intersymbol interference channel.

9. The read channel of claim 8, the controlled intersymbol interference channel being capable of being modeled as a finite impulse response (FIR) filter.

10. The read channel of claim 9, the controlled intersymbol interference channel comprising a partial response channel.

11. The read channel of claim 10, the partial response channel comprising a partial response class-IV (PR4) channel.

12. The read channel of claim 10, the partial response channel comprising an extended partial response class-IV (EPR4) channel.

13. A disk drive for accessing data, the disk drive comprising a read channel, the read channel being associated with a predetermined plurality of dominant error events, and the read channel including a decoder for decoding data accessed by the disk drive, the decoder comprising:

a Viterbi detector, the Viterbi detector being configured to detect a survivor path for an input symbol and to make a hard decision about a polarity of the input symbol based on the survivor path;

circuitry configured to determine which of the plurality of dominant error events are possible dominant error events with respect to the input symbol;

circuitry configured to determine which of the possible dominant error events has a least penalty metric with respect to the survivor path; and

a calculator configured to compute an approximation to a logarithmic likelihood ratio for the input symbol based on the survivor path and the determined possible dominant error event having the least penalty metric.

14. The disk drive of claim 13, the read channel comprising a controlled intersymbol interference channel.

15. The disk drive of claim 14, the controlled intersymbol interference channel being capable of being modeled as a finite impulse response (FIR) filter.

16. The disk drive of claim 15, the controlled intersymbol interference channel comprising a partial response channel.

17. The disk drive of claim 16, the partial response channel comprising a partial response class-IV (PR4) channel.

18. The disk drive of claim 16, the partial response channel comprising an extended partial response class-IV (EPR4) channel.

19. An apparatus for reducing complexity in a Viterbi decoding algorithm used in a communication channel, the apparatus comprising:

means for identifying a survivor path for an input symbol;

means for making a hard decision about a polarity of the input symbol based on the identified survivor path;

means for identifying a plurality of dominant error events for which the opposite polarity would be determined for the input symbol;

means for measuring a penalty metric value based on the identified survivor path for each of the plurality of dominant error events;

means for choosing a dominant error event having a least penalty metric value from the identified plurality of dominant error events; and

means for calculating an approximation to a logarithmic likelihood ratio for the input symbol based on the survivor path and the chosen dominant error event.

20. The apparatus of claim 19, the communication channel comprising a controlled intersymbol interference channel.

21. The apparatus of claim 20, the controlled intersymbol interference channel being capable of being modeled as a finite impulse response (FIR) filter.

22. The apparatus of claim 21, the controlled intersymbol interference channel comprising a partial response channel.

23. The apparatus of claim 22, the partial response channel comprising a partial response class-IV (PR4) channel.

24. The apparatus of claim 22, the partial response channel comprising an extended partial response class-IV (EPR4) channel.

25. An apparatus for accessing data from a hard disk drive using a read channel, the read channel being associated with a predetermined plurality of dominant error events, and the read channel including a decoder means for decoding data accessed by the apparatus, the decoder means comprising:

a Viterbi detector means for detecting a survivor path for an input symbol and for making a hard decision about a polarity of the input symbol based on the survivor path;

means for determining which of the plurality of dominant error events are possible dominant error events with respect to the input symbol;

means for determining which of the possible dominant error events has a least penalty metric with respect to the survivor path; and

means for calculating an approximation to a logarithmic likelihood ratio for the input symbol based on the survivor path and the determined possible dominant error event having the least penalty metric.

26. The apparatus of claim 25, the read channel comprising a controlled intersymbol interference channel.

27. The apparatus of claim 26, the controlled intersymbol interference channel being capable of being modeled as a finite impulse response (FIR) filter.

28. The apparatus of claim 27, the controlled intersymbol interference channel comprising a partial response channel.

29. The apparatus of claim 28, the partial response channel comprising a partial response class-IV (PR4) channel.

30. The apparatus of claim 28, the partial response channel comprising an extended partial response class-IV (EPR4) channel.

31. A method of reducing complexity in a Viterbi decoding algorithm used in a communication channel, comprising the steps of:

identifying a survivor path for an input symbol;

making a hard decision about a polarity of the input symbol based on the identified survivor path;

identifying a plurality of dominant error events for which the opposite polarity would be determined for the input symbol;

measuring a penalty metric value based on the identified survivor path for each of the plurality of dominant error events;

choosing a dominant error event having a least penalty metric value from the identified plurality of dominant error events; and

calculating an approximation to a logarithmic likelihood ratio for the input symbol based on the survivor path and the chosen dominant error event.

32. The method of claim 31, the communication channel comprising a controlled intersymbol interference channel.

33. The method of claim 32, the controlled intersymbol interference channel being capable of being modeled as a finite impulse response (FIR) filter.

34. The method of claim 33, the controlled intersymbol interference channel comprising a partial response channel.

35. The method of claim 34, the partial response channel comprising a partial response class-IV (PR4) channel.

36. The method of claim 34, the partial response channel comprising an extended partial response class-IV (EPR4) channel.

37. A method of accessing data from a hard disk drive using a read channel, the read channel being associated with a predetermined plurality of dominant error events, the method comprising the steps of:

identifying a survivor path for an input symbol;

making a hard decision about a polarity of the input symbol based on the identified survivor path;

identifying a plurality of dominant error events for which the opposite polarity would be determined for the input symbol;

measuring a penalty metric value based on the identified survivor path for each of the plurality of dominant error events;

choosing a dominant error event having a least penalty metric value from the identified plurality of dominant error events; and

calculating an approximation to a logarithmic likelihood ratio for the input symbol based on the survivor path and the chosen dominant error event.

38. The method of claim 37, the read channel comprising a controlled intersymbol interference channel.

39. The method of claim 38, the controlled intersymbol interference channel being capable of being modeled as a finite impulse response (FIR) filter.

40. The method of claim 39, the controlled intersymbol interference channel comprising a partial response channel.

41. The method of claim 40, the partial response channel comprising a partial response class-IV (PR4) channel.

42. The method of claim 40, the partial response channel comprising an extended partial response class-IV (EPR4) channel.

43. A method of decoding convolutionally encoded data accessed by a read channel for a hard disk drive, the read channel being associated with a predetermined plurality of dominant error events, the method comprising the steps of:

identifying a survivor path for an input symbol;

making a hard decision about a polarity of the input symbol based on the identified survivor path;

identifying a plurality of dominant error events for which the opposite polarity would be determined for the input symbol;

measuring a penalty metric value based on the identified survivor path for each of the plurality of dominant error events;

choosing a dominant error event having a least penalty metric value from the identified plurality of dominant error events; and

calculating an approximation to a logarithmic likelihood ratio for the input symbol based on the survivor path and the chosen dominant error event.

44. The method of claim 43, the read channel comprising a controlled intersymbol interference channel.

45. The method of claim 44, the controlled intersymbol interference channel being capable of being modeled as a finite impulse response (FIR) filter.

46. The method of claim 45, the controlled intersymbol interference channel comprising a partial response channel.

47. The method of claim 46, the partial response channel comprising a partial response class-IV (PR4) channel.

48. The method of claim 46, the partial response channel comprising an extended partial response class-IV (EPR4) channel.

49. A storage medium for storing software for implementing a Viterbi decoding algorithm used in a communication channel, the software being computer-readable, and the software including instructions for causing a computer to:

identify a survivor path for an input symbol;

make a hard decision about a polarity of the input symbol based on the identified survivor path;

identify a plurality of dominant error events for which the opposite polarity would be determined for the input symbol;

measure a penalty metric value based on the identified survivor path for each of the plurality of dominant error events;

choose a dominant error event having a least penalty metric value from the identified plurality of dominant error events; and

calculate an approximation to a logarithmic likelihood ratio for the input symbol based on the survivor path and the chosen dominant error event.

50. The storage medium of claim 49, the communication channel comprising a controlled intersymbol interference channel.

51. The storage medium of claim 50, the controlled intersymbol interference channel being capable of being modeled as a finite impulse response (FIR) filter.

52. The storage medium of claim 51, the controlled intersymbol interference channel comprising a partial response channel.

53. The storage medium of claim 52, the partial response channel comprising a partial response class-IV (PR4) channel.

54. The storage medium of claim 52, the partial response channel comprising an extended partial response class-IV (EPR4) channel.

55. A storage medium for storing software for accessing data from a hard disk drive using a read channel, the read channel being associated with a predetermined plurality of dominant error events, the software being computer-readable, and the software including instructions for causing a computer to:

identify a survivor path for an input symbol;

make a hard decision about a polarity of the input symbol based on the identified survivor path;

identify a plurality of dominant error events for which the opposite polarity would be determined for the input symbol;

measure a penalty metric value based on the identified survivor path for each of the plurality of dominant error events;

choose a dominant error event having a least penalty metric value from the identified plurality of dominant error events; and

calculate an approximation to a logarithmic likelihood ratio for the input symbol based on the survivor path and the chosen dominant error event.

56. The storage medium of claim 55, the read channel comprising a controlled intersymbol interference channel.

57. The storage medium of claim 56, the controlled intersymbol interference channel being capable of being modeled as a finite impulse response (FIR) filter.

58. The storage medium of claim 57, the controlled intersymbol interference channel comprising a partial response channel.

59. The storage medium of claim 58, the partial response channel comprising a partial response class-IV (PR4) channel.

60. The storage medium of claim 58, the partial response channel comprising an extended partial response class-IV (EPR4) channel.

61. A storage medium for storing software for decoding convolutionally encoded data accessed by a read channel for a hard disk drive, the read channel being associated with a predetermined plurality of dominant error events, the software being computer-readable, and the software including instructions for causing a computer to:

identify a survivor path for an input symbol;

make a hard decision about a polarity of the input symbol based on the identified survivor path;

identify a plurality of dominant error events for which the opposite polarity would be determined for the input symbol;

measure a penalty metric value based on the identified survivor path for each of the plurality of dominant error events;

choose a dominant error event having a least penalty metric value from the identified plurality of dominant error events; and

calculate an approximation to a logarithmic likelihood ratio for the input symbol based on the survivor path and the chosen dominant error event.

62. The storage medium of claim 61, the read channel comprising a controlled intersymbol interference channel.

63. The storage medium of claim 62, the controlled intersymbol interference channel being capable of being modeled as a finite impulse response (FIR) filter.

64. The storage medium of claim 63, the controlled intersymbol interference channel comprising a partial response channel.

65. The storage medium of claim 64, the partial response channel comprising a partial response class-IV (PR4) channel.

66. The storage medium of claim 64, the partial response channel comprising an extended partial response class-IV (EPR4) channel.